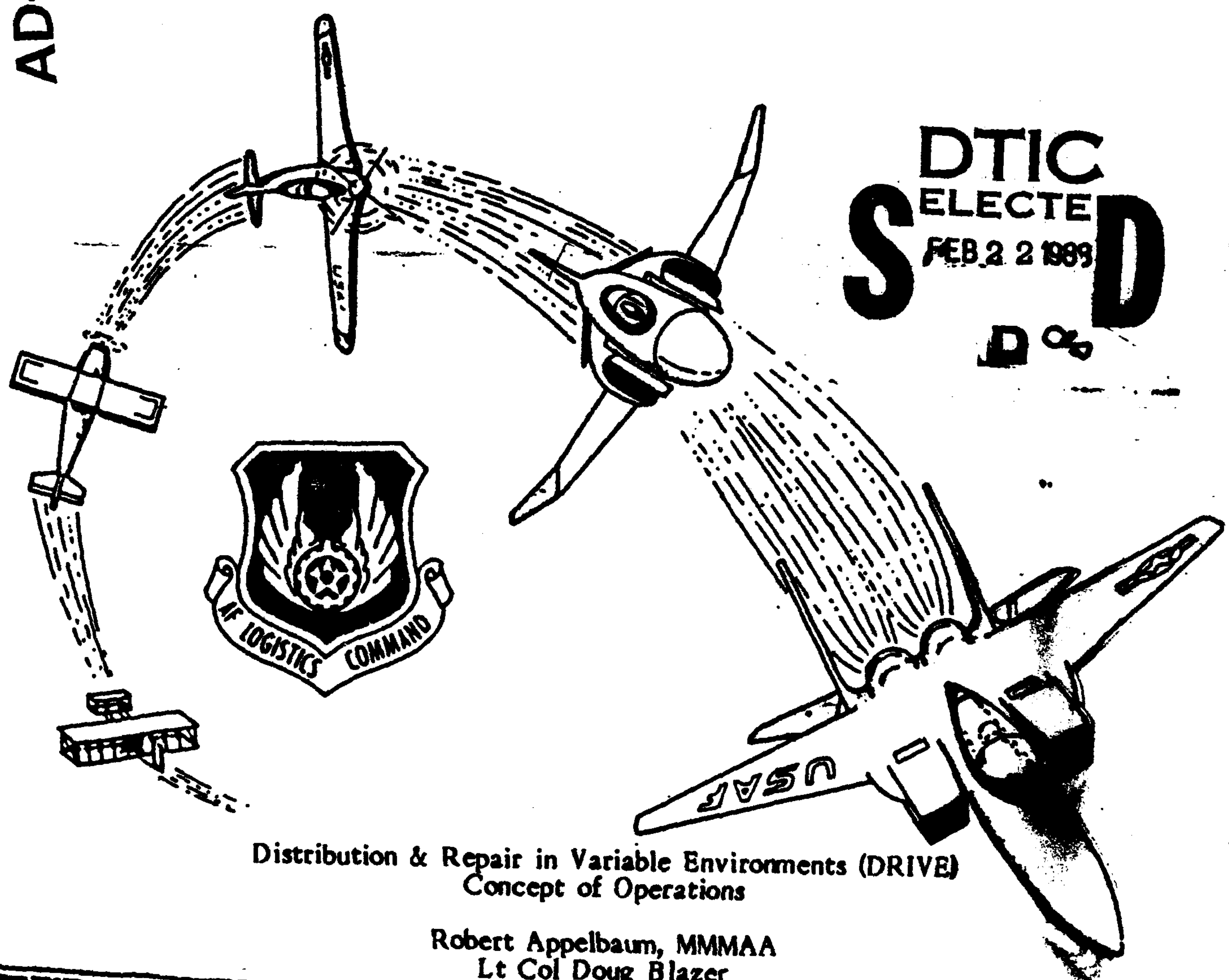
AIR FORCE LOGISTICS COMMAND

MATERIEL ANALYSIS



Distribution & Repair in Variable Environments (DRIVE)
Concept of Operations

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December 1988

ABSTRACT

The Distribution and Repair in Variable Environments (DRIVE) model uses an aircraft availability objective function to prioritize depot level repair actions and distribute serviceable assets to the base with the greatest need. This concept of operations outlines the current system, the DRIVE model, and how the Air Force will integrate DRIVE into current systems. This concept of operations also addresses DRIVE's application to quarterly repair requirements, depot repair dollar allocation and bi-weekly maintenance activity.

EXECUTIVE SUMMARY

In this concept of operations we document the logic of the Distribution and Repair In Variable Environments (DRIVE) model and the strategy for integrating DRIVE in both our current repair and distribution systems and our future Logistics Modernization Systems (LMS).

Current depot repair requirements use historical worldwide demand and asset data which can be nine months old by the time we execute the repair action. Item managers and production managers manually adjust the resulting repair requirements based on available maintenance capacity and repair dollars. This is done without any visibility of overall aircraft availability impacts. The current system usually distributes repaired assets to the oldest requisition first within three priority groups. This current system repair requirements and distribution process doesn't provide the most responsive depot support for current operational priorities in peacetime. Furthermore, this system is not structured to be responsive to changing operational priorities and uncertainties in wartime.

DRIVE prioritizes depot level repair and asset distribution actions to maximize aircraft availability within available resource constraints. In addition, DRIVE provides a tool for helping logistics managers allocate scarce exchangeable repair dollars.

This concept of operations outlines an integration strategy for achieving the benefits of DRIVE with the least disruption to both current systems and logistics modernization systems. AFLC will develop DRIVE as a separate module in the Weapon System Management Information System (WSMIS). Eventually, we will integrate DRIVE into the LMS programs to include the Requirements Data Bank (RDB), the Stock Control and Distribution (SC&D) system, the Depot Maintenance Management Information (DMMIS) system and the Contract Data Management (CDMS) system.

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CHAPTER 1
INTRODUCTION

PURPOSE

The purpose of this Concept of Operations is to describe how DRIVE will be developed and implemented. RAND Corporation developed DRIVE as a set of algorithms and data files to improve the way the current system prioritizes repair and allocates assets to directly support operational requirements. This document a) describes the functional requirement for repair prioritization and asset allocation that is responsive to operational needs, b) describes the current system as a baseline, c) summarizes the DRIVE model and its logic and d) identifies DRIVE in a fully operational mode including its system interfaces and major policy and procedural issues.

BACKGROUND

The Air Force has traditionally determined depot repair requirements based on planning forecasts using historical worldwide reparable generation averages and asset positions that are nine months old by the end of the repair production period. MM and MA negotiate the computed forecast to reflect available carcasses plus anticipated reparable generations and then adjust this quantity, using expert judgement, to reflect bit and piece availability, shop capacity, and workload objectives. Once depot maintenance repairs an item and returns it to depot supply, AFLC normally distributes the asset to the oldest requisition first within priority groups. This "first-come-first-served" system may or may not reflect the most urgent current operational need. The current system doesn't provide a practical means to achieve responsive depot support to current and near-term operational requirements in peacetime. Furthermore, the current system simply cannot respond to changing operational requirements or uncertain events in wartime. We address the current system and its shortcomings in more detail in Chapter 2.

FUNCTIONAL REQUIREMENT

The Air Force needs a repair and distribution prioritization process that is responsive to the operational needs at bases in both peace and war. Such a repair and distribution process must:

a. Be responsive to the most urgent operational needs by guiding the repair and distribution of recoverable assets so that:

(1) the Air Force expends repair resources on items yielding the highest payoff (in terms of available aircraft) to operational units.

(2) the Air Force distributes items to locations where they provide the greatest improvement in reaching defined aircraft availability goals.

b. Achieve this responsiveness by using up-to-date data about operational requirements (force structure beddown, activity levels, and goals) and current world-wide asset status by location.

c. Use aircraft availability logic and up-to-date data to create new management reports for functional logistics managers. These reports must improve management visibility and understanding of repair and distribution actions needed or actions taken for individual items and how these actions contribute to the readiness and sustainability of a weapon system.

d. Make data system interfaces with minimum disruption to established logistics management systems and planned logistics modernization programs.

e. Provide tools that support management decision-making in the allocation of Depot Repair and Modification (DepRep/Mod) funds. These tools must show impacts of funding allocation alternatives on the readiness and sustainability posture of the operational forces.

BASIC CONCEPT OF DRIVE

The Distribution and Repair In Variable Environments (DRIVE) model is a near-term planning and execution decision tool that will enable logistics managers to direct depot level recoverable item repair and distribution actions that are responsive to current operational requirements. It will also be useful for quarterly workload planning and DepRep/Mod exchangeable funding allocations to determine the workload mix that maximizes aircraft availability under constrained exchangeable (BP15 aircraft spares) repair funding.

DRIVE uses up-to-date information about operational requirements (weapon system availability goals and planned activity at each operating location) to guide decisions about what support actions best achieve these operational requirements. It will also consider the current support posture by using up-to-date worldwide asset status information. Through its decision logic, DRIVE suggests depot repair and distribution actions to best achieve operational requirements. DRIVE determines the mix of items to repair that provide the greatest availability within repair resource constraints. DRIVE then shows where to send the serviceable assets: to the bases where they have the greatest impact on achieving availability goals.

In operation, DRIVE will provide feedback and control. It will continually monitor feedback from the field. The monitoring will include the status of Line Replaceable Unit (LRU) and Shop Replaceable Unit (SRU) assets at each operating location (serviceable, in repair, awaiting parts, in transit), the number of aircraft at each location, the planned level of operational activity, and the relative importance of each weapon system at each location. From the depot, DRIVE will monitor feedback that includes LRU and SRU asset status (serviceables, reparable carcasses, in repair, awaiting parts) and available repair capacity by type of critical repair resource. Using this feedback information, DRIVE will perform its control function by determining the most cost-effective mix of repair and distribution actions needed to achieve operational requirements.

DRIVE will work toward supporting the aircraft availability goals designated by operational commanders. During periods of operational stability, DRIVE will have a stabilizing influence on repair and distribution actions at the depot. When operational requirements become dynamic (which DRIVE will "sense" by continually monitoring feedback from the field), DRIVE will suggest adjustments to logistics support actions needed to meet the new operational requirements. Most significantly, DRIVE will focus management attention, and the relative importance of required action, on those situations needing special attention. Examples include cases where new operational requirements surface, force beddown is altered, or a breakdown in depot support occurs.

Ogden Air Logistics Center (OO-ALC) is currently using DRIVE in three F-16 avionics repair shops to prioritize repair and distribution actions. The scope of this demonstration includes 32 Line Replaceable Units (LRUs) and 204 Shop Replaceable Units (SRUs) that are F-16 peculiar and repaired and managed at OO-ALC.

APPROACH AND BENEFITS

DRIVE is the mechanism to prioritize depot repair workload and the distribution of assets to maximize combat capability. DRIVE meets the functional requirement because DRIVE will:

a. Use depot repair resources to repair the mix of items that contributes the most to both peacetime and wartime aircraft availability.

b. Allocate serviceable assets--LRUs and SRUs needed by base level maintenance to repair unserviceable LRUs--to maximize weapon system capability.

c. Allocate DepRep/Mod funding to repair the best mix of assets to achieve aircraft availability goals.

d. Provide management products for logistics managers at all levels. These products will aid managers in taking actions that have the highest payoff in weapon system capability and allow for the automated tracking of DepRep/Mod budget execution.

e. Identify chronically ill items that enlightened repair or distribution cannot solve and provide the basis for management action to resolve the problem.

f. Highlight mal-distributed serviceable assets in the field.

CONCEPT FORMAT

This introductory chapter described the functional requirement satisfied by DRIVE, the basic concept of DRIVE and the expected benefits of implementing DRIVE. We've divided the remainder of this Concept of Operations into four Chapters. Chapter 2 describes the current system. Chapter 3 describes the DRIVE model inputs, logic, output and application. Chapter 4 describes DRIVE in the fully operational mode, highlighting inputs, interfaces, processing frequency, changes to procedures/policy and uses of DRIVE. Chapter 5 provides our conclusions.

CHAPTER 2
CURRENT SYSTEM

INTRODUCTION

We address the current system in two sections. The first section outlines the current system for repair and allocation of serviceable items in both peacetime and wartime. In the second section, we describe the weaknesses of the current system.

CURRENT SYSTEM DESCRIPTION

REPAIR REQUIREMENTS

The Air Force manages its depot repair process through a collection of six automated data systems. They include the Recoverable Consumption Item Requirements System (D041), the Repair Requirements Computation System (D073), the Management of Items Subject to Repair (MISTR) Requirements, Scheduling and Analysis System (G019C), the Depot Maintenance Material Support System (G005M), the Depot Supply Stock Control System (D033), and the Economic Order Quantity Buy and Computation System (D062).

The Recoverable Consumption Item Requirements System (D041) "computes" the repair requirement. The system uses data such as flying hour programs, usage rates, and asset positions to compute both buy and repair requirements. Technically speaking, the requirements system actually computes the total requirement, then "backs into" the repair requirement. What's left becomes the buy requirement.

To determine the repair requirement the current system computes the total requirement, then stratifies existing serviceable assets and anticipated base repair against the requirement. If serviceables and base repair won't satisfy the complete requirement, the current system identifies the carcasses available (and expected carcass turn-ins) for depot repair. Then, the system computes a depot repair requirement based on the number of unserviceable assets available and the outstanding need. The Requirements System (D041) outputs these repair requirements by master stock number and feeds them into the Repair Requirements Computation System (D073).

The Repair Requirements Computation System (D073) identifies the total repair requirement. It accepts up to 25 quarters of repair requirements from the Requirements System (D041) by master stock number and converts it to actual stock number requirements using a Not Repairable This Station (NRTS) percent. For example, if the total repair requirement is ten and there are five NRTS for Item A (the master stock number) and five NRTS for Item B (an interchangeable stock number), the Repair System (D073) converts the repair requirement of ten into a requirement of five for Item A and five for Item B. It then outputs an Intermediate Range Requirements Projection Worksheet or X-21 document for each item, which identifies the repair requirement for the negotiation process.

The Item Management Specialist (IMS) reviews the X-21 document and passes it to the Production Management Specialist (PMS). The PMSs "negotiate" with their maintenance counterparts to determine what to repair based on expected component parts availability, repair capacity constraints, and available exchangeable repair dollars to come up with a planned repair quantity by NSN. This "face to face" negotiation process results in a negotiated repair quantity.

Figure 2-1 shows the system interfaces and system flow of the repair process in flow chart form.

Current Repair Process

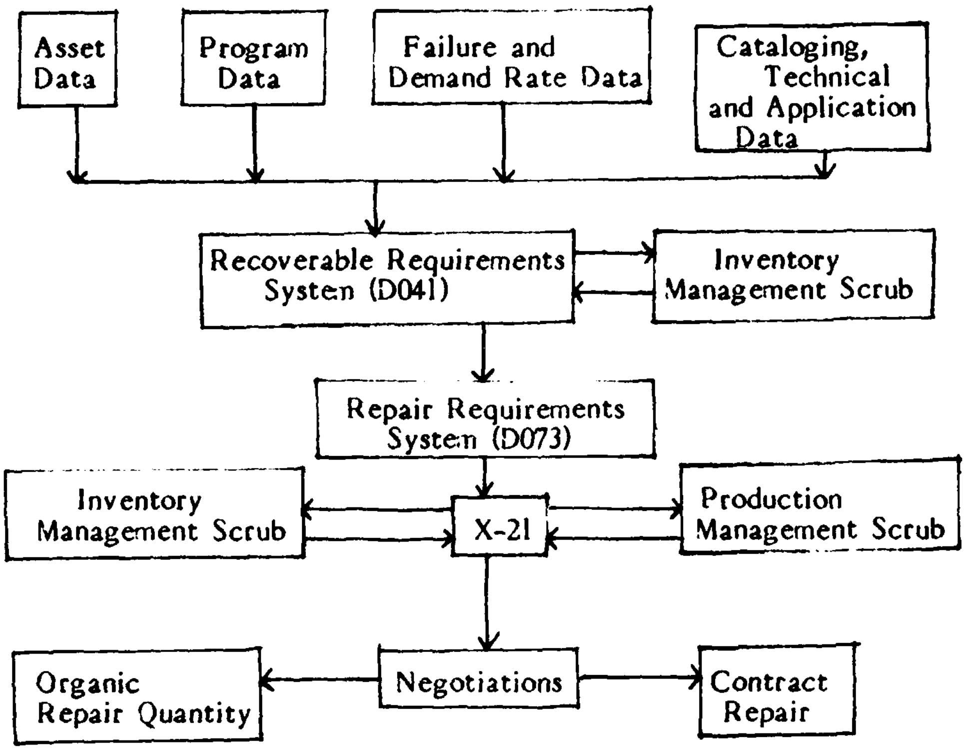


Figure 2-1

In Figure 2-2, we present a time line for the major repair process actions.

Repair Time Line

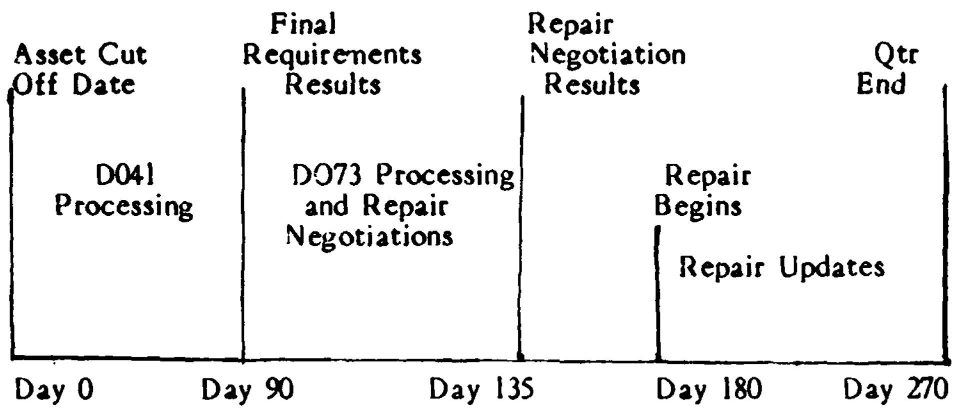


Figure 2-2

Repair begins 90 days after the computation of the requirement and six months after the "as of" or cut-off date for the data feeding the system. Thus, the current system computes repair requirements based on forecasted failures, carcass returns and projected repair actions from 180 to 270 days into the future. Furthermore, the system basses its forecast of failures on a two year moving average, resulting in very slow reaction time to changing requirements.

We emphasize that the current repair requirement doesn't consider repair capacity constraints or available repair dollars. The backed into repair requirement from the Recoverable Consumption Item Requirements System (D041) is "constrained" solely by the projected number of available carcasses. The PMSs use their judgement to consider capacity and funding constraints during the negotiation cycle. The current system doesn't use marginal analysis or other optimizing technique to prioritize repair. The current system treats each item's backed into repair requirement as equally important to every other item within the computation. It is up to the PMS to decide what to repair given limited capacity or funds. The PMS does know the item's mission item essentiality code, its current back order position and whether the item is critical (in the Air Force Critical Item Program). However, the PMS has no information available that identifies the importance of one item versus another based on operational capability and no way to optimize the repair requirement. So, there is no guarantee the repair quantities selected by the PMS will maximize aircraft availability.

On a quarterly basis, AFLC performs the process described and shown in Figures 2-1 and 2-2. However, there is a bi-weekly process to change repair quantities as necessary. The PMS can change the repair quantity with the input of an AFLC Form 804, Re-Negotiation document. The Form 804 input includes the new repair quantity plus a reason for the change in the quantity.

COMPONENT PARTS REQUIREMENTS

QUARTERLY PROCESSING

The previous section described how the current system determined repair requirements. The next step in the process is to identify the repair requirements to maintenance and to determine the component parts needed to repair the end items. Figure 2-3 portrays this process in flow chart form.

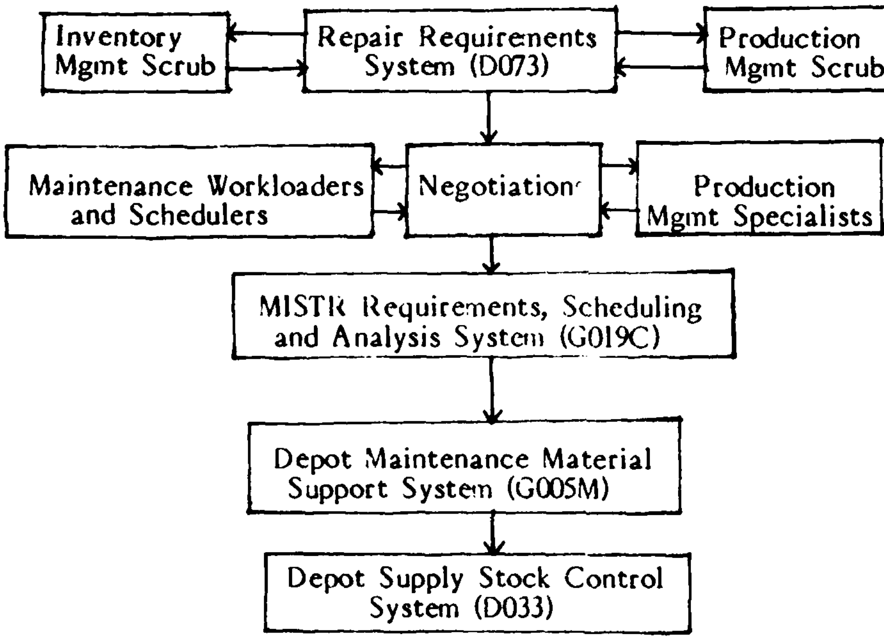


Figure 2-3

The PMS inputs the item by item negotiated quantities into the Management of Items Subject to Repair (MISTR) Requirements, Scheduling and Analysis System (G019C). This system reports the negotiated quantity to maintenance. This system also includes codes that identify reasons for differences between the repair requirement and the negotiated quantity, and reasons for changing the negotiated quantity.

The Repair Scheduling System (G019C) breaks down the item by item repair requirements into five different "precedences." These precedences are based upon the relative priority of requisitions currently outstanding against the item and the time horizon of the requirement. Precedences 1-3 identify the current quarter repair requirement. This includes the portion of the overall negotiated quantity which depot maintenance should complete in the next two weeks and over the rest of the current quarter. The system uses precedences 1-3 to adjust parts projection for the current quarter. Precedence 4 identifies the next quarter's negotiated workload so that parts can be ordered to support the upcoming quarter's workload. The system uses precedence 5--next year's requirement--for retention purposes. The Repair Scheduling System (G019C) converts the negotiated quantities into these precedences (one through five) and passes this information to the Material Support System (G005M).

The Material Support System (G005M) consists of a Bill of Materials (BOM) that identifies the component parts necessary to repair any exchangeable end item. The Material Support System (G005M) uses this information, along with the repair requirements passed from the Repair Scheduling System (G019C), to project the number of component parts required to support all negotiated end item repair. The Material Support System (G005M) then passes the component part requirements to the Depot Supply System (D033). The Material Support System (G005M) also passes component part usage data to the EOQ System (D062).

The Depot Supply System (D033) computes stock levels necessary to support the identified maintenance workload and records distribution of serviceable and unserviceable assets to depot maintenance facilities.

The EOQ System (D062) accepts the usage information from the Material Support System (G005M) and uses it to compute EOQ parts buys.

Chapter 4 details how DRIVE will interface with these systems as the current system does today. For example, after integrating DRIVE the system will adjust component part buys--based on the DRIVE repair quantities--through the interface of DRIVE and the Repair Scheduling System (G019C).

BI-WEEKLY PROCESS

The bi-weekly MISTR process involves only the Repair Scheduling System (G019C), the Material Support System (G005M), and the Depot Supply System (D033). This process identifies the importance of the repair of each end item and is the mechanism by which changes to the negotiated repair quantity are made. If circumstances dictate a change in the negotiation quantity for an item or set of items, the bi-weekly MISTR process takes this information (normally input through an adjustment made by the PMS) and adjusts component part requirements to reflect the new need. In addition, managers track repair using the MISTR bi-weekly processing.

Bi-weekly, the Repair Scheduling System (G019C) recomputes the precedence requirements based on new information about negotiation quantities and outstanding requisitions. The Repair Scheduling System (G019C) passes these adjustments to the Material Support System (G005M). The Materiel Support System (G005M) adjusts the quarterly parts projection and passes them to the Depot Supply System (D033). This system adjusts parts orders in accordance with these maintenance workload adjustments.

WAR REPAIR REQUIREMENTS

The wartime repair requirements process is the same as the peacetime process; the current system will depend on the production management specialist to identify the units' or base's wartime needs and to ensure they are properly prioritized. There is no systematic, automated way to increase the priority of repair for units in a war setting or even to prioritize the allocation of assets to these war units. Nor is there a way to understand the current supply status of operational units through this system. The repair requirements system will react slowly to the wartime needs because it uses old data and it uses a two-year average of data. As a result, the system is not well suited to wartime processing—it relies on the human element to override the system to support war units without providing the information required to perform this function properly.

ALLOCATION OF SERVICEABLE ASSETS

So far we have described the current repair requirements negotiation and parts projection process. Once an asset is repaired it is available for distribution to the field. Currently, bases requisition assets based on Standard Base Supply System (SBSS) computed levels or the Central Leveling System (D028) allocated levels. The system satisfies these requisitions with on hand assets. When assets aren't on hand the system backorders the requisitions and fills the backordered requests first-come-first-served by requisition priority group as assets become available. The Air Force has 15 priority levels, aggregated into three overall groups. The system fills priority group 1 (priority 1 through 3) back orders before priority group 2 (priority 4 through 8) and priority group 3 (priority 9 through 15). The system also fills the oldest requisition within a given priority group first. This system provides no measurement of how well distribution is supporting operational mission goals and cannot ensure assets are distributed optimally among competing needs.

PRIORITY OF UNSERVICEABLE RETURNS

The Air Force Reparable Item Movement Control System (RIMCS) controls the movement of unserviceable assets from field locations to the depot. It assigns codes (either mechanically or through manual intervention by an item's Item Management Specialist) that relate to the shipment priority of an item. If an item is "critical" (i.e., in the Air Force Critical Item Program) or the IMS designates the item "important", the system assigns a priority shipment code that directs shipment of the unserviceable carcass via priority transportation. If not, the system assigns a low priority shipment code that directs shipment of the carcass via routine retrograde shipment. This system doesn't explicitly consider the need for the carcass at the depot maintenance facility when determining the shipment code. Therefore, the system can direct bases to ship carcasses back to a depot via high priority transportation even though there are sufficient carcasses at the depot to "cover" anticipated depot repair.

THE AIR FORCE CRITICAL ITEM PROGRAM

The Air Force Critical Item Program (CIP) identifies items that have a negative impact on both peacetime and wartime capability so that corrective actions can be taken. It does this by categorizing items into three categories--critical, potential critical and problem--so that increased management attention can be paid to these items. The AFCIP categories use a selection criteria that considers such things as MICAPs, weapon system factors and estimates of wartime sustainability. The CIP outputs lists identifying the items that fall into each category and produces an AFLC Form 74 (a form showing a get well plan for the item) for items that are in the critical category. This system doesn't explicitly consider LRU/SRU indenture relationships. In addition, it does not have the capability to automatically identify the cause of the item's problem or identify the aircraft availability impact of not repairing the item.

WEAKNESSES OF THE CURRENT SYSTEM

The current system has a number of shortcomings.

1. No systematic aircraft availability oriented prioritization of repair. The current system identifies the total repair requirement. If there aren't sufficient funds to repair the full requirement, the current system can't identify what portion of the requirement to repair to achieve the greatest level of aircraft availability for the dollars spent.

2. Old data. The current system uses data which is from six- to nine-months old. The current system must forecast the reparable generations and repair actions from the data cut-off date to the present (again six to nine months). When these forecasts are not accurate—failures and repair actions are uncertain, highly variable events—the repair requirement can be inaccurate.

3. Non-optimal allocation of repair resources. Since the current system doesn't optimize repair (identify the mix of items to repair to maximize peacetime and wartime aircraft availability), it does not optimally allocate repair resources. It does not guarantee the use of the right capabilities in the repair shops to maximize operational availability.

4. Repair and distribution decisions are not based on weapon system goals. The current system does not prioritize repair or distribute assets to maximize unit-level combat capability. In addition, there is no way to ensure higher priority units receive the appropriate allocation of assets. There is no system to ensure spares needed for units engaged in war receive a higher repair priority or higher share of the assets. There is no way to link repair and distribution to unit support goals. Finally, there is no systematic method for balancing support across all weapon systems and operational goals within resource constraints.

5. Non-optimal asset distribution. Distributing serviceable assets to the oldest requisition within priority group does not ensure the best use of the next available asset. Assets should be distributed to the unit where they will achieve the greatest increase in aircraft availability, not necessarily the unit that put in a requisition first.

6. Priority of unserviceable returns not based on mission impacts. Currently, item managers have the option to manually assign RIMCS codes which indicate the priority for shipment of unserviceable carcasses back to the depot. In some cases we ship assets using priority airlift even though the carcass is not needed to support operational needs through depot repair. This expends critically short Second Destination Transportation (SDT) funds on the wrong set of items. The Air Force needs a system which considers how critical the base unserviceable returns are to supporting mission requirements through depot repair when assigning RIMCS codes.

7. Insufficient information for management decisions. In today's system, managers do not know the weapon system impact of repair funding decisions. There are no reports that provide managers the readiness and sustainability impact of changing repair funding allocations by weapon system or Air Logistics Center. At the item level, there is no information to identify the weapon system impacts of not repairing an item. Therefore item management and production management specialists have no way to make repair trade-off decisions to maximize system support and repair shop effectiveness.

8. <u>The Air Force Critical Item Program.</u> The Air Force CIP does not explicitly consider LRU/SRU indenture relationships when identifying critical items. In addition, it does not have a method for identifying the aircraft availability impact of not repairing an item.

In the next two chapters we describe the DRIVE model and how it addresses each of these current system shortcomings.

CHAPTER 3
MODEL OVERVIEW

INTRODUCTION

The goal of DRIVE is to determine depot repair quantities and allocate available repair resources to achieve weapon system availability goals. Air Force management will set weapon system availability goals based on operational priorities. DRIVE will use those goals and current asset status to determine how to best support those Air Force priorities through depot repair and distribution actions.

This chapter provides a non-technical description of the DRIVE model. We discuss the DRIVE objective function, data requirements, logic, output products and applications. We also describe possible extensions of DRIVE to point out that DRIVE's availability logic is not exclusively limited to aircraft recoverable spares. Application to other commodities may also provide a payoff to the Air Force.

OBJECTIVE FUNCTION

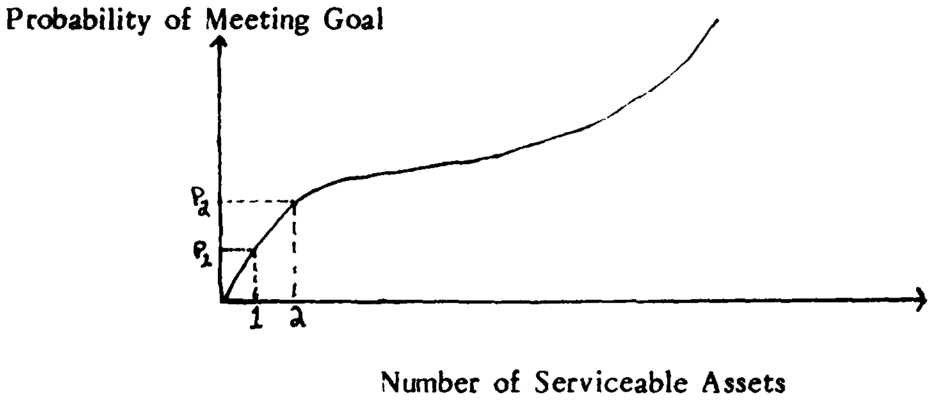
DRIVE considers the impact on aircraft availability of repair and distribution decisions over a specified planning horizon. DRIVE computes how much the repair of unserviceables and distribution of serviceables for each item to each potential receiving location will contribute to aircraft availability at the end of the planning horizon. DRIVE maximizes the probability that all bases meet their aircraft availability goals, for all aircraft types, at the end of the planning horizon subject to a given level of repair resources. DRIVE can also compute the appropriate repair and distribution priorities to achieve any one of a number of aircraft availability related objectives (e.g., minimize total aircraft down at end of the planning horizon).

Several components are key to understanding the current objective function. The first is the aircraft availability goal. Each base/Mission Design Series (MDS) combination is assigned an aircraft availability goal. The goal is specified as a fraction mission capable aircraft. For example, if the goal at a base is .75, then DRIVE would produce a list of repair/distribution actions to achieve up to 75 percent (e.g., 18 of 24 aircraft) Fully Mission Capable (FMC) status at that base.

The second component is the planning horizon. The planning horizon is the forecast period for the DRIVE model run. This period consists of the production period (e.g., biweekly or quarterly) plus a shipping time in days to the base. DRIVE uses planned flying hours during this period to determine total expected demands on the depot from each base. DRIVE will use this information to work toward the desired availability goal needed at the end of the planning horizon. For combat coded units, DRIVE considers an additional 30 da s of planned wartime flying. The objective in this case is to ensure that combat code l units can fly their peacetime mission during the planning horizon and, at the end of that time, be able to sustain 30 days of wartime flying with their WRSK assets.

The third key component of the DRIVE objective function is "all bases." DRIVE makes trade-offs between bases to achieve the best overall support. DRIVE uses the availability goals to determine the relative priority of a base. DRIVE uses these goals, coupled with current asset status for each base, to determine which base has the greatest need.

ITEM X AT BASE Y



Sample Cumulative Probability Distribution
Figure 3-1.

The last key component is probability. DRIVE recognizes demands are not always predictable, but are distributed about some expected average demand rate. As each new serviceable becomes available at a base, DRIVE can measure the improved chances (probability) of meeting the desired availability goal. Figure 3-1 depicts an example of a probability distribution for an item (Item X) at a base (Base Y). On the graph, P1 is the probability that one or fewer units of stock will satisfy the availability goal. P2 is the probability that two or fewer units of stock will satisfy the availability goals. The difference, P2 - P1, is the increase in the probability of achieving the stated aircraft availability goals gained by adding the second unit of stock. This improvement, coupled with the repair cost of providing that asset, is the decision measure DRIVE uses in ranking the return on investment for each repair/distribution action.

DRIVE INPUTS

DRIVE uses standard Air Force data system inputs to the maximum extent possible. At this time, some of those inputs are obtained manually. For example, an automated Logistics Command and Control (LOG C2) system does not now exist that provides flying hour requirements and aircraft availability goals. Appendix B lists all input elements currently used by DRIVE and those we expect to need in the future. We briefly describe some of the key input data elements below:

a. Near-Term Flying Activity. DRIVE must know the level of activity to support during the planning horizon. The level of activity is expressed in terms of expected flying hours. Because DRIVE tries to support peacetime and wartime operations, the inputs include both peacetime and wartime flying hours.

1. Peacetime Operations.

a. Units with only a peacetime tasking. The objective is to have all assets in place at each unit by the end of the planning horizon in order to have the greatest chance of achieving aircraft availability goals. Near term flying hours are specified by base/MDS for the peacetime planning horizon, which is the production period plus shipping time to the receiving location.

b. Units with a wartime tasking in addition to the peacetime mission. The objective is to have all assets in place at each unit by the end of the peacetime planning horizon in order to be ready to support the 30 day wartime tasking. DRIVE currently adds a generic 30 day wartime flying program to the peacetime flying program. This way, DRIVE can determine repair and distribution actions needed during peacetime depot operations to provide the needed War Readiness Spares Kits/Base Level Self Sufficiency (WRSK/BLSS) assets. As the Air Force enhances DRIVE, we may use unit specific wartime flying programs. Unit specific data will require that some portions of DRIVE operate in a classified processing environment even though most inputs (excluding goals and flying program), and all outputs, will be unclassified.

2. Wartime Operations. In wartime, the planning horizon will be the time depot repair takes plus the order and ship time. The flying hour, number of aircraft and availability goal inputs must come from a wartime Command and Control (C2) system that reflects the mission requirements for each MDS at each location.

b. Aircraft Availability Goals. As with the flying hour program, availability goals are assigned by MDS by location. The goals reflect the relative operational importance across all combinations of weapon systems at all bases. The model distinguishes between units with a peacetime only mission (no WRSK/BLSS authorization) versus those with both a peacetime and a wartime tasking (WRSK/BLSS authorization). We set goals in the same manner for each type unit. The goals depend on the readiness and sustainability requirements. A tactical fighter unit, for example, has a goal--the Direct Support Objective (DSO)--of 75 percent aircraft available at D+30. This is the sustainability requirement for that unit. The peacetime portion of the planning horizon, however, may require a higher goal to make sufficient POS assets available to support the peacetime flying program.

c. Worldwide Asset Status. DRIVE considers a current worldwide picture of asset status at the depot, of in-transit assets and of assets at each applicable base or operating location with a stock record account number (SRAN). DRIVE considers available repair resources and the availability goals at all bases. Up-to-date resource data by location is the key to DRIVE's ability to determine which assets the bases need and how best to satisfy that need.

DRIVE currently extracts base level asset status (on-hand and due in from maintenance (DIFM)) and in-transit status from the Central Knowledge System (D143H). The source for base-level Awaiting Parts (AWP) data, which helps determine the SRU/LRU repair mix, is the Stock Control and Distribution System (D035). AWP data may be extracted from the Awaiting Parts System (D165A) as soon as AFLC completes planned corrective actions on that system. Depot-level asset status is obtained from the Depot Supply Stock Control and Distribution System (D033), the Depot Maintenance Material Support System (G005M), and the MISTR Requirements, Scheduling and Analysis System (G019C).

d. Configuration Data. Configuration data, which is necessary to define modification or other configuration differences by MDS, by tail number, and by unit, is unavailable in existing data files and processes. This data is important to identifying unserviceable assets which maintenance can modify to the needed configuration. DRIVE can then include these unserviceables as part of what maintenance can repair during a production period. A fully operational system needs accurate configuration information to be most effective.

e. Component Data. Component item data includes demand rates, standard repair hours, repair shop, SRU replacement factors, Not Reparable This Station (NRTS) factors and similar data used to compute expected repair demands at the depot and ascertain which repair resources are needed for that repair action. The Recoverable Consumption Item Requirement System (D041) currently provides peacetime demand rates and NRTS rates. The Weapon System Management Information System/Requirements Execution Availability Logistics Module (WSMIS/REALM) will be the source for wartime item demand rates.

f. Production Capacity Constraints. DRIVE uses constraints on production capacity to determine the most effective mix of repairs when different items compete for the same repair resources. Managers can update resource constraints with each DRIVE run. A spinoff benefit of considering production resources and capacity constraints is that AFLC can quantify resource bottlenecks in terms of their impact on operational capability. DRIVE could provide a number of new management products to help with capacity planning and budgeting.

DRIVE LOGIC

The DRIVE prioritization process is a straightforward extension of concepts developed in the Dyna-METRIC model now used for worldwide weapon system assessments and for computing WRSK/BLSS requirements. A basic description of this process follows.

a. For each item, DRIVE computes the total expected depot demands generated by each base during the planning horizon. DRIVE uses the total expected demands and a variability factor (variance to mean ratio) to develop a demand probability distribution for each item at each base.

b. Using the demand distribution (see Figure 3-1) and the current asset position, DRIVE computes the probability that a base will meet its availability goal. DRIVE then assesses the availability impact of adding a serviceable asset at a given base and prepares a list, for each item at each base, of the increase in availability expected when a serviceable asset is added.

c. After DRIVE has identified the payoff (increased chance of meeting the availability goal) associated with adding a specific item at a specific base, it must decide how best to satisfy each expected demand. The decisions DRIVE can make and the logic DRIVE uses to reach those decisions are as follows:

1. DRIVE can satisfy demands in several ways. The demand could be for an LRU at a base, for a SRU at the base or for a package of SRUs needed to repair an Awaiting Parts (AWP) LRU at a base. Each possible action to satisfy the demand--supply an item from stock, finish repair of an LRU, or induct an LRU or SRU--also has an associated cost which is expressed in terms of standard repair hours. These hours are engineered standards that reflect the use of repair resources for each repair action. Note that instead of using standard repair hours as a measure of cost, DRIVE could use repair (DepRep/Mod) dollars equally as well. The possible ways to supply an asset and the associated cost are summarized in Table 3-1.

SUPPLY OPTION	ASSOCIATED COST (STD REPAIR HRS)
1. Supply an LRU	
a. Ship from stock	= 1 Hour
b. Repair an AWP LRU at the depot	= Standard hours for the LRU + standard hours for each SRU needed.
c. Induct/repair an LRU	= Standard hours for the LRU + the sum of (replacement factor x SRU standard hours) for each SRU.
2. Supply an SRU	
a. Ship from stock	= 1 Hour
b. Induct/repair an SRU	= Standard hours for the SRU

Table 3-1

Note: In the model mathematics DRIVE uses 1 hour rather than zero as the cost to ship from on-hand stock because the decision measure (discussed later) is AVAILABILITY INCREASE divided by STD REPAIR HOURS. We cannot divide by "zero" repair hours and get a meaningful answer.

2. DRIVE combines the cost and availability improvement to reach its recommended action. If an item is in stock (no repair cost), DRIVE will send it to the base having the biggest payoff in increased availability. DRIVE satisfies this demand without expending repair resources.

(a) After DRIVE determines how to best allocate the on hand supply of stock, it next determines what to repair. To do this, DRIVE uses a marginal analysis technique very similar to the approach used in making financial decisions. It looks for the best return (increased availability) for the investment (standard repair hour). DRIVE computes the return per investment by dividing the expected increase in availability by the total standard repair hours needed to complete the repair action.

(b) To make a repair decision, DRIVE computes the increase in availability per standard repair hour for each possible repair action and the cost of providing the repair. This is done for each possible shipping location for that item. DRIVE computes the measure of payoff: the increase in availability divided by repair cost. DRIVE then selects the repair plus distribution action that provides the highest payoff.

3. This process continues until DRIVE reaches all availability goals or until it exhausts all possible repair actions, whichever comes first.

d. DRIVE records all repair and distribution priorities for an item in the form of a list. DRIVE prioritizes each list using the same measure: availability improvement per repair resource hours or dollars consumed.

Once DRIVE completes the lists for each individual item, it merges the individual lists and applies resource constraints. For example, a maintenance shop may repair several different NSNs. These NSNs, in turn, 'compete' for the available hours in that shop. DRIVE will merge the individual NSN lists and 'draw a line' at the point that all available repair hours in that shop are consumed. The marginal analysis measure provides a common basis that allows lists to be merged at selected levels. Similarly, lists could be merged by division, weapon system or ALC and constrained by available repair resources—either standard repair hours or DepRep/Mod funding.

OUTPUT

This section discusses current DRIVE output products. We address potential new output products in Chapter 4. Appendix A contains examples of current products.

a. Bi-weekly production list by shop (Figure A-1). DRIVE produces a prioritized list by depot maintenance shop with each bi-weekly DRIVE production run. The list consists of the recommended priority of repair for that shop's items. DRIVE draws a goal line that reflects the normal capacity of the maintenance shop (in standard repair hours) and indicates how much repair the shop should accomplish during the production period.

b. Bi-weekly distribution list by National Stock Number (NSN) (Figure A-2). DRIVE provides this list to the Item Management Specialist (IMS). The list contains the prioritized ranking of distribution actions for each NSN. Current practice at the OO-prototype is for the IMS to release assets in accordance with the list, contingent upon a requisition for that NSN existing in the system.

c. 90-day DRIVE constrained repair quantity list (Figure A-3). This list contains all NSNs in the DRIVE data base and reflects the recommended quarterly repair requirement at various resource constraints. The OO-ALC prototype uses constraints given in terms of standard repair hours. Expressing constraints in terms of DepRep/Mod dollars will be an important step in using this type of output to support analysis of DepRep/Mod funding alternatives.

MODEL APPLICATION

This Concept of Operations calls for three related, yet distinct, applications of the DRIVE algorithms. These applications are the Quarterly DRIVE Planning Quantity Forecast, DepRep/Mod Allocation Tool, and Production Period Repair Forecast. They are all similar in that they will use common data files (with changes to some inputs) and the DRIVE algorithms. These DRIVE applications will differ in frequency of use, purpose and output products. We more fully address these applications in Chapter 4. The following paragraphs will relate some of the modeling differences among the applications.

Quarterly DRIVE Planning Quantity Forecast

The purpose of this application is to identify the upcoming quarter's constrained repair quantity prior to the negotiation process. The DRIVE quarterly computed quantity will compliment the Recoverables Requirements System (D041) and Repair Requirements System (D073) computed requirement. As AFLC implements the production period computation (see below) the quarterly 'requirement' will become a planning number. DRIVE will compute the true item by item repair quantity during the bi-weekly production period run.

The scope of application for the quarterly computation will be all Management of Items Subject to Repair (MISTR) items (Repair Group Category "J") that are subject to aircraft availability goals. Those NSNs computed by the Aircraft Availability Model in the Requirements System (D041) are all candidates for inclusion in DRIVE. Items that aren't directly related to aircraft availability goals will be the subject of further research to determine methods for inclusion.

DepRep/Mod Allocation Tool

The second application of DRIVE is to support management decision-making on DepRep/Mod allocation alternatives. This computation will use the same data files as the quarterly requirements computation. The main distinguishing feature will be in the use of this computation.

DRIVE will automatically transmit the quarterly computation to the Repair Requirements System (D073) for use by Item Management Specialist (IMS), Production Management Specialist (PMS), etc. On the other hand, the DepRep/Mod allocation runs will be a tool for analyzing impacts of DepRep/Mod allocation strategies on ALC workload, support to operational forces, organic versus contract impacts, shop capacity planning, etc. This should be an "off-line" iterative process to analyze various funding allocation strategies.

The results of the DepRep/Mod allocation runs may also have use in determining resource constraints (hours or dollars) for the quarterly DRIVE runs. In addition to its use as a planning tool, DepRep/Mod allocation will also support repair and distribution program execution.

DRIVE must provide management products to array results in a variety of ways. The DRIVE allocation tool should quantify impact on ALCs, weapon system support and individual shops for use in the decision-making process.

Production Period Repair Quantity Computation

The third DRIVE application is the near-term production period computation, also known as the "bi-weekly" production period. The quarterly computation will serve as a planning estimate but will not provide the flexibility needed to enable rapid responses to changing needs in the field. These changes include demand rate fluctuations, force beddown changes and altered availability targets. These changes, exacerbated by battlefield dynamics, will become even more critical in time of war. Use of shorter forecasting periods is a very important method of dealing with potential changes and uncertainties. By 'looking out the window' more often to gather data on the current asset picture, DRIVE will more quickly identify changes and can reorder repair and distribution actions to better reflect current support requirements.

With this greater flexibility and responsiveness comes a fundamental change in the focus of depot repair. The current view is that the quarterly repair goal is an inviolate charter with exception taken only for major system breakdowns (MICAPs). DRIVE recognizes the dynamics of operational needs within the quarter and provides AFLC with the ability to respond to those changes in a timely manner. Thus the DRIVE Quarterly Planning Quantity will be exactly that: a planning tool not an inviolate charter.

EXTENSIONS TO DRIVE

This concept of operations describes DRIVE for aircraft spares. DRIVE also offers the potential for extension to items other than aircraft recoverables. Support equipment, for example, is a major driver in providing available aircraft. Translating that impact directly to availability will be a major research effort in extending the DRIVE algorithms. If accomplished, however, the Air Force will add a significant number of items to weapon system management.

Missiles, engines, communication-electronics and other commodities are separate research efforts. Success in these areas would allow the Air Force repair to manage and measure performance in terms of weapon system availability goals.

CHAPTER 4
DRIVE INTEGRATION IN CURRENT SYSTEMS

INTRODUCTION

This chapter describes how we plan to integrate the Distribution and Repair In Variable Environments (DRIVE) model into the current Management of Items Subject to Repair (MISTR) process. We divide this chapter into five sections. The first section once again overviews the current MISTR system--both quarterly and bi-weekly processing. The second describes the Depot Repair and Modification (DepRep/Mod) funds allocation capabilities and the quarterly DRIVE process: the data feeds into DRIVE and the output from DRIVE and how this will be integrated in the current system. The third section defines the bi-weekly DRIVE process, detailing the data feeds and the DRIVE output. The fourth section outlines the integration of DRIVE within the proposed Logistics Modernization System (LMS) infrastructure. The last section identifies development and implementation issues raised by the proposed integration strategy.

CURRENT SYSTEM REVISITED

To highlight how we will integrate DRIVE into our current systems we once again briefly describe today's process.

QUARTERLY PROCESS

As we showed in Chapter 2, the current MISTR process is actually six major systems--the Recoverable Consumption Item Requirements System (D041), the Repair Requirements Computation System (D073), the MISTR Requirements, Scheduling and Analysis System (G019C), the Depot Maintenance Material Support System (G005M), the Depot Supply Stock Control System (D033), and the Economic Order Quantity Buy and Computation System (D062).

The Requirements System (D041) is the source of buy and repair requirements for most recoverable items in the Air Force inventory. The repair requirement (the portion of the requirement affected by DRIVE) is constrained by the requirement deficit (that portion of the total requirement that has not been satisfied by serviceable assets or base level repair) and the estimated number of unserviceable assets available for repair. The Requirements System computes requirements quarterly and projects buy and repair requirements for 25 quarters into the future. This information is then passed to the Repair Requirements System (D073).

The Repair Requirements System (D073) accepts a range of data from the Requirements System (D041). This includes up to the full 25 quarters of repair requirement information. The Repair System (D073) portrays up to 3 years of this data in quarterly increments and identifies the remaining data by fiscal year on an Intermediate Range Requirements Projection Worksheet (X-21) document. The Inventory Management Specialists (IMS) assigned to the item uses this document to validate the identified repair requirements. The Production Management Specialist (PMS) then uses the X-21 to "negotiate" repair with their maintenance counterparts for both organic or contract repair. AFLC refers to this process as a "face to face" negotiation.

The PMS enters data on actual negotiated quantities by stock number into the Repair Scheduling System (G019C), which segments the quantities into different "precedences" based upon the relative priority of requisitions currently outstanding against the item. The Repair Scheduling System (G019C) then passes this information to the Material Support System (G005M) for component part requirements projection.

The Material Support System (G005M) uses the Bill of Materials (BOM) along with the negotiated quantities passed to it from the Repair Scheduling System (G019C) to identify the component parts necessary to support the identified level of end item repair. The Material Support System (G005M) passes these component part requirements to the Depot Supply System (D033). The Material Support System (G005M) also passes component part usage data to the EOQ System (D062).

The Depot Supply System (D033) computes stock levels necessary to support the identified maintenance workload and records distribution of serviceable and unserviceable assets to depot maintenance facilities.

The EOQ System (D062) accepts the usage information from the Material Support System (G005M) and uses it to compute economic order quantity (EOQ) parts buys.

BI-WEEKLY PROCESS

The bi-weekly MISTR process involves only the Repair Scheduling System (G019C), the Material Support System (G005M), and the Depot Supply System (D033). This process identifies the importance of the each end item repair and permits changes to the identified repair quantity.

Bi-weekly, the Repair Scheduling System (G019C) recomputes the precedence requirements based on new information about negotiation quantities and outstanding requisitions. The system passes the adjustments to the Material Support System (G005M), which then adjusts the quarterly parts projection and passes that information to the Depot Supply System (D033). The Depot Supply System D033 will adjust parts orders in accordance with these maintenance workload adjustments.

THE QUARTERLY DRIVE PROCESS

In this section we describe the input interfaces to the quarterly version of DRIVE. We also describe the output interfaces necessary to implement DRIVE as part of the quarterly process.

DRIVE provides a way to prioritize repair and execution--it's not a requirements system. We can fit DRIVE's planning horizon to match interfacing system requirements. Here, we discuss DRIVE as a quarterly process: DRIVE's planning horizon is one quarter. However, if needs change, we can easily adapt DRIVE to any new horizon.

The quarterly repair quantity identified by DRIVE maximizes performance within existing resource constraints. The current system will still generate all forecasts of out-year repair requirements (forecasts beyond one quarter) for use by AFLC managers. DRIVE will simply provide complimentary repair quantity information to the Repair Requirements

System (D073) and will prioritize depot level repair to maximize both peacetime and wartime capability within available resources. In the current version of DRIVE, the major resource constraint is available maintenance shop hours and how many test stand hours are available to be used in the repair of DRIVE items in each production period. The mature version of DRIVE will be able to incorporate various other constraint data.

DRIVE will also provide a tool for the quarterly allocation of Depot Repair and Modification (DepRep/Mod) exchangeable repair funds. To do this, DRIVE will use the identified DepRep/Mod program authority as a resource constraint just as it currently uses maintenance test stand time. DRIVE will identify a repair mix that "spends" the available exchangeable DepRep/Mod dollars to achieve the highest probability of achieving stated aircraft availability goals. DRIVE will compute a repair quantity for the upcoming negotiation quarter which will maximize aircraft availability performance against the unit's weapon system performance targets within available exchangeable repair dollars.

The DRIVE repair quantity is the amount to repair that maximizes performance within available resources. The DRIVE repair quantity will compliment the Requirements System (D041) computed repair requirement for the same quarter. To do this, DRIVE will accept data from the systems identified in Appendix A. Briefly, DRIVE accepts application and technical data from the Requirements System (D041), base level asset data from Central Knowledge System (D143H), base level awaiting parts data from the Item Management Stock Control and Distribution System (D032), depot reparable and awaiting parts data from Depot Maintenance Production Tracking System (G004L), depot serviceable and unserviceable asset information from the Depot Supply System (D033), and test stand, repair hour, and aircraft data from specially built files. Using the data described above, DRIVE will identify a sub-group master quarterly repair quantity for the upcoming negotiation quarter. This quantity and the input data may require review by the Item Management Specialist (IMS) and the Production Management Specialist (PMS). This number is finalized and passed to the Repair System (D073).

The Repair System (D073) will accept resource constrained prioritized repair quantities for all items in DRIVE for the upcoming repair negotiation quarter. Other longer-range requirements data (beyond first quarter) will pass from the Requirements System (D041) to the Repair System (D073) as it does today.

The Repair System (D073) will produce a document similar to the current X-21 document which identifies the breakdown of sub-group master NSN data to actual NSN level and identifies the actual NSN repair requirement. We will modify this document to include data on current asset position and increases in aircraft availability per repair along with information on the DRIVE ranking of the NSN. The modified X-21 will give management the "right" data to make repair trade-off decisions between items.

The IMS will review this document just as is the current X-21 and the PMS will use it during face to face negotiations. This process identifies the planned production by NSN for both organic and contract repair. Upon completion of the negotiation process, the system will pass organic repair quantities into the Repair Scheduling System (G019C). The component parts project process then continues as usual. The system will pass contract repair quantities to the Contract Repair System (G072D).

The quarterly version of DRIVE will also pass data to both the Stock Control and Distribution System (D035) and the Air Force Recoverable Item Central Leveling System (D028). In some sense, these systems will be oblivious to the introduction of DRIVE. They will accept data just as they have always done even though DRIVE will determine the actual "numbers" in place of the current system.

The Central Leveling System (D028) will accept average base repair percent and the Organizational and Intermediate Level Maintenance (OIM) world-wide requirement from the Requirements System (D041). The current implementation plans for DRIVE will not change the Central Levelling System (D028) logic. However, a potential future modification of the Central Leveling System (D028) will allow this system to use DRIVE data to allocate levels to bases in a way that considers aircraft availability goals and available serviceable assets.

The introduction of the Quarterly DRIVE process will not change the feed of data to SC&D (D035). SC&D will obtain the control level, the support level, and four quarters of MISTR output requirements via DRIVE. This will include the negotiation quarter DRIVE quantities. DRIVE will simply manipulate one data element, the negotiation quarter repair quantity, to reflect a quantity that maximizes performance with available resources. This is the same quantity identified in the DRIVE quarterly planning requirement.

THE BI-WEEKLY DRIVE PROCESS

The bi-weekly or repair production version of DRIVE uses the same data elements as the quarterly version of DRIVE. DRIVE will update the bi-weekly data base with the most current information available. The bi-weekly planning horizon consists of the production period (bi-weekly) plus the shipping time in days to the base. DRIVE will then identify the new priority of repair for the items in the quarterly process and provide it to both the Repair Scheduling System (G019C) and to appropriate maintenance personnel. In addition to the repair quantity update, DRIVE will suggest where to ship serviceable assets to maximize aircraft availability. The IMS may review this information for errors, including data on carcasses and item level factors, if deemed necessary by the functional OPRs. DRIVE will accept error corrections and will then produce a finalized repair quantity forecast for the next production period. DRIVE will provide the results to the Repair Scheduling System (G019C) as the precedence 1 requirement. Note that other precedences may require computational adjustments as a result of this process. DRIVE will also provide the finalized repair quantity to maintenance personnel so they can order carcasses and component parts for the upcoming production period.

The Repair Scheduling System (G019C) will accept any adjusted repair quantities and adjusted repair priorities from DRIVE each production period. These forecasts will replace the current Repair Scheduling System (G019C) precedence 1 requirement (i.e., the bi-weekly repair quantity). As in today's process, the systems will use this information to adjust the current quarter component part requirements through the Repair Scheduling System (G019C), Material Support System (G005M), and Depot Supply System (D033).

DRIVE will also provide information on repair quantity and priority forecasts to the maintenance shop schedulers and workloaders. This will serve to restate the maintenance output required over the upcoming production period to support operational needs. DRIVE will provide this information to maintenance personnel so they can order unserviceable assets and component parts required to support the specified repair.

In addition to identifying the repair quantity, DRIVE will also provide information on such things as the current asset position and the peacetime and wartime aircraft availability impacts of the items identified for repair. We plan to develop management reports and computer screens for DRIVE to provide this information. Due to both the available DRIVE data and the weapon system orientation of DRIVE, we can develop output products that provide impact information and weapon system orientation—data that isn't available in the current system. The DRIVE system design will include the design and implementation of these output products.

DRIVE also provides a prioritized list of serviceable asset suggested shipment destinations for all of the assets in the DRIVE data base. These suggestions identify locations where the serviceable asset will yield the greatest gain in aircraft availability if shipped to that location. DRIVE will provide this distribution list to SC&D (D035) and to match against current requisitions in the system. If a requisition exists for the item to the location suggested by DRIVE, SC&D (D035) will release the serviceable asset to the DRIVE suggested location. If no requisition exists, then the asset will be available for shipment to the next DRIVE location or to satisfy any new requisition in the system. For events such as MICAPs, foreign military sales requisitions, or other service requirements—exceptions not currently considered in DRIVE—we are developing additional logic as part of the overall system design to address these requirements through an automated release mechanism.

USING DRIVE WITH OTHER CURRENT SYSTEMS

PRIORITY OF UNSERVICEABLE RETURNS

As discussed in Chapter 2 of this Concept of Operations, RIMCS controls the movement of unserviceable assets back to the depot from field locations. This system must identify the true "need" of the unserviceable carcass to optimally use limited SDT funds. RIMCS accomplish this by using DRIVE's data base to identify the number of carcasses on-hand at the depot, the number of carcasses at each base and by identifying DRIVE stated priority of repair by item. DRIVE will pass this information to the RIMCS system so it can identify the proper transportation priority for each item.

THE AIR FORCE CRITICAL ITEM PROGRAM

DRIVE implicitly identifies items that are more important than others during its repair and distribution prioritization process. This may, at times, differ from the CIP identification of items. Therefore, the CIP should incorporate DRIVE information to categorize items. This will ensure the get well plans are consistent with what DRIVE identifies as the repair quantities and the repair bottlenecks for a given item or set of items.

INTEGRATION OF DRIVE WITH PROPOSED LMS INITIATIVES

INPUT

DRIVE, as described above, will not be dependent on the implementation schedule of any Logistics Modernization System (LMS). It will have the capability to interface with current systems and interface with LMS programs as they become operational. In the future we will incorporate DRIVE into the Requirements Data Bank (RDB) Repair Segment where it will receive data on requirements, applications, and technical factors from the other RDB segments. It will accept data from the Contract Data Management System (CDMS) on repair and new procurement contracts when available and will accept asset data from the Stock Control and Distribution (SC&D) system. Lastly, AFLC will design an interface with the Depot Maintenance Management Information System (DMMIS) so that DRIVE can receive and use maintenance data.

OUTPUT

DRIVE will also have the capability to provide data to new LMS systems. DRIVE will provide data on shipment suggestions to the SC&D system when SC&D is capable of using the data. In addition, repair quantity forecasts will be available via the RDB Repair Segment.

In the case of DMMIS, DRIVE will provide periodic updates of item level quantity forecasts and priorities and will convert these priorities to DMMIS "due dates" during each production period. DMMIS can use this to adjust its "Master Production Schedule" as required. Quarterly, DRIVE will identify a dollar constrained prioritized organic repair forecast to DMMIS so that DMMIS can do capacity planning using the Materiel Management (MM) stated priorities.

ISSUES RAISED BY INTEGRATION STRATEGY

DRIVE offers capabilities never before possible under the current repair and distribution processes. For example, DRIVE provides the capability to accomplish item management with a weapon system focus. Because DRIVE is a new system, we are identifying other issues raised by our implementation and integration strategy. The following is a list of the major issues that must be addressed as the Air Force develops and implements DRIVE.

1. Sources of some DRIVE data. As we develop DRIVE, we must review its data sources to ensure they are the most timely and accurate available. In other cases, we must find new data sources. For instance, we must identify the sources of the "Special Data Files" list of elements and the contractor repair and procurement data so we can include them in the final version of DRIVE.

2. Memorandums of agreement (MOAs). Due to the data needed by DRIVE, the implementation of DRIVE will require MOAs with current systems and LMS systems.

3. Repair contract modification. DRIVE needs specific kinds of data from contractors who do depot level repair. It may be necessary to modify existing contracts or to design contracts in the future to require this data from the contractors.

4. Requirements document modification. The Intermediate Range Projection Worksheet (X-21) produced by the Repair Requirements Computation System (D073) must be modified to include new information on current asset position and on the impacts of an item on operational support.

5. Management Information Product Improvement. DRIVE and the output from DRIVE has the potential for greatly improving existing management products. DRIVE can introduce a weapon system orientation to management information products which lack this orientation and can provide estimates of the impacts of an item or set of items on operational support.

6. Frequency of DRIVE computation. DRIVE has the ability to react quickly to changing operational requirements. As a result, it may be necessary to re-evaluate how often DRIVE is "run" in a production mode. For example, we speak in this chapter of a bi-weekly production run. However, it may be necessary to run DRIVE more or less often due to changing requirements and differing production planning horizons. In addition, DMMIS may require a change in the frequency of DRIVE "runs".

7. Directorate of Distribution (DS) issue priorities. DRIVE reduces the time between identifying a repair quantity and the execution against the forecast. The modified repair process (including DRIVE) must include a method for routine carcass and parts ordering under shorter lead times.

8. Asset Allocation. We need to program, within the serviceable asset release mechanism, automatic allocation of serviceable assets to DRIVE suggested shipment destinations. We need special logic to handle MICAPs, foreign military sales, training requirements, and other service requisitions.

9. Headquarters allocation of exchangeable DepRep/Mod funds to the Air Logistics Centers (ALCs). We need to explore the use of DRIVE to allocate programmed DepRep/Mod dollars by ALC.

10. ALC allocation of DepRep/Mod dollars to Weapon Systems. DRIVE has the capability to change the allocation of DepRep/Mod dollars among various weapon systems. We need to determine the policy for using this capability to maximize Air Force wide combat capability across weapon systems.

11. Volitility in the repair forecast DRIVE in both a quarterly and bi-weekly application may suggest changes to the repair plan each production cycle because of changes in operational requirements. This forces maintenance to adjust its production schedule. We need to determine the level of volitility and design a method to ensure that this volitility is reduced to the lowest possible level. So that maintenance is not required to radically change production schedules each production cycle.

CHAPTER 5
CONCLUSIONS AND ACTIONS

CONCLUSIONS

1. The Air Force needs a repair and distribution prioritization process that is responsive to the operational needs at bases in both peace and war.

2. Current system repair and distribution decisions do not maximize aircraft availability.

3. The Distribution and Repair In Variable Environments (DRIVE) model directly relates repair quantity and prioritization decisions to weapon system availability goals rather than backorder goals.

4. DRIVE prioritizes repair and distributes serviceable assets to maximize both peacetime and wartime aircraft availability.

5. The current system uses data which is six to nine months old.

6. DRIVE uses current data on asset position and carcass availability.

7. DRIVE explicitly considers the LRU/SRU indenture relationship when determining repair and distribution trade-offs.

8. DRIVE distributes assets to the base with the most pressing aircraft availability need rather than first-come-first-serve according to MILSTRIP priorities.

9. DRIVE provides an explicit return on investment. DRIVE can relate repair dollars, maintenance man-hours or capacity use to aircraft availability.

10. AFLC can use DRIVE as a funds allocation tool to help in the allocation of Depot Repair and Modification (DepRep/Mod) exchangeable repair dollars.

11. The Air Force can integrate DRIVE with current systems and with LMS systems proposed and under development.

12. The Air Force can implement DRIVE with minimal disruptions to current systems and proposed LMS systems.

ACTIONS

1. Develop and implement DRIVE Quarterly Planning Quantity Forecast process. (OPR: HQ AFLC/MMMA, OCR:HQ AFLC/MMMR)

2. Develop and implement DRIVE DepRep/Mod Funding Allocation Tool. (OPR: HQ AFLC/MMMA, OCR:HQ AFLC/MMMP/MMMR)

3. Develop DRIVE Bi-Weekly Production process. (OPR:HQ AFLC/MMMA/MAPM, OCR: HQ AFLC/MMMR)

APPENDIX A

This Appendix presents examples of output products in use with the DRIVE pre-production prototype at OO-ALC.

Figure 1 - Maintenance Shop Priority List

Figure 1 is an excerpt of a prioritized repair list for the RF stand in the LRU shop. The NSN, receiving location and record keeping indicators (cumulative repairs, carcasses left and total cumulative repair hours) are included.

The shop uses the list as a guideline during the production period. They are to follow the list as closely as possible but must also take into account such things as setup times when developing the actual production schedule. An explanation for each column follows.

Column Heading	Description
SEQ	Sequential numbering of items on the shop priority list.
FIN IND	Indicates whether item is already in repair and should be finished (F) or if it should be inducted and repaired (I).
MASTER NSN	National Stock Number of item. LRUs start in the first position while SRU NSNs are indented.
Item Description	Description information on item including noun, IMS code and Work Unit Code.
Part Number	Self-explanatory.
Control Number	Maintenance internal code.
Base	DRIVE designated receiving location.
CUM IND	Cumulative repairs for this NSN.
CARCS LEFT	DRIVE estimate of remaining reparables at the depot.
STD HRS	Engineered standard repair hours.
TOT HRS	Total cumulative standard repair hours.
Notes Column	Explanation if repair is not possible.

SEQ	FIN IND	MASTER NSN	ITEM DESCRIPTION	PART NUMBER	CONTROL NUMBER	BASE	CUM IND	CARCS LEFT	STD HRS	TOT HRS	CAUSE OF INABILITY TO TAKE PROD COUNT
1	F	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	1	22	26.7	27	
2	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	2	21	26.7	53	
3	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	3	20	26.7	80	
4	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	4	19	26.7	107	
5	F	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	NELL	1	14	26.7	134	
6	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	5	18	26.7	160	
7	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	HOME	6	17	26.7	187	
8	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	MOOD	7	16	26.7	214	
9	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	TORR	8	15	26.7	240	
10	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	9	14	26.7	267	
11	F	1270-01-102-2962WF	LOW PWR RFHA4VA74AB0	681R622G02	26019A	HILL	1	24	26.7	294	
12	I	1270-01-102-2962WF	LOW PWR RFHA4VA74AB0	681R622G02	26019A	NELL	2	23	26.7	320	
13	F	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	NELL	2	13	26.7	347	
14	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	HOME	1	9	26.7	374	
15	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	HILL	10	13	26.7	401	
16	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	HOME	11	12	26.7	427	
17	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	12	11	26.7	454	
18	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	13	10	26.7	481	
19	I	1270-01-102-2962WF	LOW PWR RFHA4VA74AB0	681R622G02	26019A	HILL	3	22	26.7	507	
20	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	HILL	14	9	26.7	534	
21	I	1270-01-102-2962WF	LOW PWR RFHA4VA74AB0	681R622G02	26019A	NELL	4	21	26.7	561	
22	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	NELL	3	12	26.7	587	
23	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	MOOD	15	8	26.7	614	
24	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	TORR	16	7	26.7	641	
25	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	NELL	17	6	26.7	668	
26	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	MCEN	18	5	26.7	694	
27	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	HILL	19	4	26.7	721	
28	I	1270-01-093-2174WF	ANTENNA RAHA3VA74AA0	62R707G01	25589A	MACD	1	40	42.0	763	
29	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	JACK	20	3	26.7	790	
30	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	KADE	21	2	26.7	816	
31	I	1270-01-102-2962WF	LOW PWR RFHA4VA74AB0	681R622G02	26019A	TUCS	5	20	26.7	843	
32	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	HOME	2	8	26.7	870	
33	I	1270-01-102-2965WF	LOW PWR RFHA4VA74AB0	681R622G01	16318A	KELL	22	1	26.7	896	
34	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	JACK	3	7	26.7	923	
35	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	GREA	4	6	26.7	950	
36	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	MCEN	4	11	26.7	977	
37	I	1270-01-146-463[illegible]WF	ANTENNA HA3VA74AA0	750R400G01	25880A	HOME	1	3	42.0	1019	
38	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	MOOD	5	10	26.7	1045	
39	I	1270-01-102-2962WF	LOW PWR RFHA4VA74AB0	681R622G02	26019A	MACD	6	19	26.7	1072	
40	I	1270-01-102-2962WF	LOW PWR RFHA4VA74AB0	681R622G02	26019A	MCEN	7	18	26.7	1099	
41	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	TORR	5	5	26.7	1125	
42	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	KELL	6	4	26.7	1152	
43	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	HOME	7	3	26.7	1179	
44	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	HOME	6	9	26.7	1205	
45	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	MOOD	7	8	26.7	1232	
46	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	NELL	8	7	26.7	1259	
47	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	MOOD	8	2	26.7	1285	
48	I	1270-01-102-2963WF	LOW PWR RFHA4VA74AB0	681R622G04	36217A	KADE	9	1	26.7	1312	
49	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	KADE	9	6	26.7	1339	
50	I	1270-01-102-2966WF	LOW PWR RFHA4VA74AB0	681R622G03	49202A	TORR	10	5	26.7	1366	

Figure 2 - Distribution Priority List

Figure 2 is an example distribution priority listing for a specific item (NSN 1270-01-045-3976). DRIVE prints a separate report for each NSN which goes to the item manager. Chapter 4 of the Concept of Operations addresses automatic transmission of distribution priorities to SC&D (D035).

A description of each column follows.

Column Heading	Description
PRTY	Priority of distribution.
Master NSN	National Stock Number.
Description	Description information including noun and work unit code.
Supply Acct	Stock Record Account Number (SRAN) of the DRIVE designated receiving location.
ORG	Organizational symbol of the receiving location.
Base Name	Name of the base receiving this item.
Blank	Remarks area.

D I S T R I B U T I O N   P R I O R I T I E S

24MAR8803

OGDEN ALC F-16 AIS & SRU SHOPS

PRTY	MASTER NSN	DESCRIPTION	SUPPLY ACCT	ORG	BASE NAME	
1	1270-01-045-3976WF	FIRE COMP HWTVH74CA0	FB4829	31TFW	HOMESTEAD	______________________________
2			FB2823	ADTCE	EGLIN	______________________________
3			FB4829	31TFW	HOMESTEAD	______________________________
4			FB4829	31TFW	HOMESTEAD	______________________________
5			FB4829	31TFW	HOMESTEAD	______________________________
6			FB4852	474/57	NELLIS	______________________________
7			FB2805	AFFTC	EDWARDS	______________________________
8			FB4852	474/57	NELLIS	______________________________
9			FB4829	31TFW	HOMESTEAD	______________________________
10			FB4852	474/57	NELLIS	______________________________
11			FB4829	31TFW	HOMESTEAD	______________________________
12			FB4852	474/57	NELLIS	______________________________
13			FB2823	ADTCE	EGLIN	______________________________
14			FB4852	474/57	NELLIS	______________________________
15			FB4814	56TTW	MACDILL	______________________________
16			FB6022	TFFS	TUCSON	______________________________
17			FB4829	31TFW	HOMESTEAD	______________________________
75			FB5573	401TFW	TORREJON	______________________________
76			FB4830	347 TFW	MOODY	______________________________
77			FB2027	419/388	HILL	______________________________
78			FB4852	474/57	NELLIS	______________________________
79			FB6432	149TFG	KELLY	______________________________
80			FB6401	169TFG	MCENTIRE	______________________________
81			FB5222	PLSC	KADENA	______________________________
82			FB2027	419/388	HILL	______________________________
83			FB4852	474/57	NELLIS	______________________________
84			FB6151	127TFFS	MCCONNELL KN	______________________________
85			FB4829	31TFW	HOMESTEAD	______________________________
86			FB4814	56TTW	MACDILL	______________________________
87			FB5573	401TFW	TORREJON	______________________________
88			FB4830	347 TFW	MOODY	______________________________
89			FB2027	419/388	HILL	______________________________
90			FB4852	474/57	NELLIS	______________________________
91			FB6401	169TFG	MCENTIRE	______________________________
92			FB4829	31TFW	HOMESTEAD	______________________________
93			FB6432	149TFG	KELLY	______________________________
94			FB2805	AFFTC	EDWARDS	______________________________
95			FB5573	401TFW	TORREJON	______________________________
96			FB2027	419/388	HILL	______________________________
97			FB5222	PLSC	KADENA	______________________________
98			FB4852	474/57	NELLIS	______________________________
99			FB4830	347 TFW	MOODY	______________________________
100			FB2027	419/388	HILL	______________________________
101			FB4852	474/57	NELLIS	______________________________
102			FB4887	58TTW	LUKE	______________________________
103			FB4829	31TFW	HOMESTEAD	______________________________
104			FB5573	401TFW	TORREJON	______________________________
105			FB4830	347 TFW	MOODY	______________________________
106			FB6022	TFFS	TUCSON	______________________________

Figure 3A - Quarterly DRIVE Constrained Repair Requirements List

Figure 3A is an excerpt of a 90-day DRIVE constrained repair requirenents listing. DRIVE gives quarterly repair quantities for a series of different constraints (HRS 1 through HRS 11). DRIVE arranges the itens by LRU family—i.e., the Fire Control Computer (RCP) and its indentured SRUs. DRIVE also displays portrays information (on-hand, in repair and expected NRTS) to show additional potential limitations.

A description of each column follows.

Column Heading	Description
NSN	National Stock Number. LRUs start in first position, SRUs are indented.
Noun	Name of item
Maint Facil	Maintenance shop at the depot repairing this item -- CI, DI, RF, PA are LRU shop stands — D = Digital, A = Analog, M = Microwave SRU shop
Std Rep Hrs	Standard repair hours. These are engineered standards.
Carcasses	
- OH	On-hand reparable at the depot.
- IR	In-repair. Already inducted into the depot maintenance shop and maintenance has started repair.
- EXP	Expected NRTS actions during the forecast period.
Exp Dmds	Expected demands on the depot from all bases for this NSN. This includes demands expected during the forecast period plus, for combat coded bases, expected demands during the first 30 days of war.
Requirements 99%	The number of repairs required to achieved a 99 percent probability that all bases meet their goal.
HRS 1 through HRS 11	The recommended repair quantities for each NSN given the repair hour limits represented by HRS 1, HRS 2, etc. Figure 3A lists those hour constrains by total and by shop.

90-day DRIVE results using 13-JAN-88 PFOUT
(* - this LRU met the 99% confidence limit)

		MF AA IC NI TL	STD REP HRS		-CARCASSES-			REQUIREMENTS																
NSN	NOUN			STK	OH	IR	EXP	EXP DMDS	HRS 1	HRS 2	HRS 3	HRS 4	HRS 5	HRS 6	HRS 7	HRS 8	HRS 9	HRS 10	HRS 11	HRS 12	HRS 13	HRS 14	HRS 15	HRS 16
1270-01-045-3976WF	FIRE COMP	CI	9.2	1	58	1	13	78 *	0	0	0	0	0	0	0	0	0	1	1	1	1	8	16	72
1270-01-065-3427WF	PROCESSOR1	D	8.2	7	15	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1270-01-065-7867WF	CCA MULTIP	D	8.2	15	31	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1270-01-066-5979WF	POWER CONV	A	9.5	6	19	4	12	12	0	0	0	0	0	0	0	0	0	1	1	2	2	11	15	58
1270-01-067-2075WF	CCA DIGITA	D	8.2	0	16	1	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6	19
1270-01-067-2076WF	CCA MEMORY	D	9.7	2	57	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	5
1270-01-068-7880WF		D	9.2	58	42	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1270-01-069-4390WF	CONVERTER	D	9.5	2	32	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	6
1270-01-070-2774WF	CCA COMMON	D	7.7	16	25	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1270-01-079-4168WF	CCA PROC	D	8.5	2	38	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6	20
1270-01-093-2174WF	ANTENNA RA	RF	15.0	2	43	0	57	122	8	10	13	15	17	20	22	27	31	35	50	66	78	96	100	100
1270-01-093-2256WF	RADAR XMTR	RF	24.4	1	62	0	20	107	1	1	1	3	4	6	9	12	14	16	17	17	17	18	21	82
1270-01-083-0398WF	PRESS VSL	M	32.0	16	185	16	83	83	18	29	36	47	58	64	71	78	87	93	95	98	106	123	157	340
1270-01-083-0473WF	POWER SPLY	A	9.2	1	4	2	2	2	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2
1270-01-084-7356WF	DIGIBUS BD	D	6.6	1	2	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	4
1270-01-097-6096WF	DETECT ASY	M	5.1	0	2	5	8	8	1	1	1	2	3	4	5	6	7	8	8	8	8	11	11	35
1270-01-115-3249WF	BOARD ASSY	A	10.2	1	24	5	9	9	1	1	1	2	2	3	4	4	5	5	5	5	5	5	7	32
1270-01-094-6872WF	RCP 74AH0	DI	6.3	5	58	2	23	41 *	0	0	0	0	0	0	0	0	0	5	11	13	14	20	29	73
1270-01-069-6483WF	BOARD ASSY	D	7.1	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1270-01-072-6306WF	BOARD ASSY	D	7.1	1	7	0	0	0 .	0	0	0	0	0	0	0	0	0	2	4	4	5	5	7	13
1270-01-094-8505WF	HUD PDU	DI	20.3	0	3	0	17	97	0	0	0	0	0	0	0	0	0	0	1	1	2	3	4	20
1270-01-075-4768WF	PANEL CONT	A	7.0	1	74	4	24	24	0	0	0	0	0	0	0	0	0	2	7	11	14	21	31	108
1270-01-075-4864WF	PDU HVPS	A	12.0	1	29	8	8	8	0	0	0	0	0	0	0	0	0	0	1	1	3	4	8	55
1270-01-078-1818WF	PWR SUPPLY	A	6.5	2	36	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
1270-01-116-9554WF	VIDIO	A	7.5	6	16	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
1270-01-117-8597WF	VIDEO DRV	A	7.0	1	26	1	4	4	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	32
1270-01-102-2962WF	LOW PWR RF	RF	26.7	2	14	2	14	70	1	1	3	4	8	12	16	20	25	26	26	28	30	30	30	30
1270-01-077-0710WF-A	REC ASSY	M	30.6	1	9	13	18	18	2	10	16	20	25	28	30	33	35	36	37	38	39	43	54	54
1270-01-077-0836WF-B	PWR SUPPLY	A	8.5	1	4	2	2	2	0	0	0	0	1	2	2	3	4	4	4	4	4	4	5	13
1270-01-985-4653WF	REF SOURCE	M	30.6	5	5	6	11	11	0	0	5	9	13	17	19	21	24	24	24	27	28	28	36	40
1270-01-099-3205WF-C	PHASE LOCK	M	28.0	2	10	3	6	6	0	0	1	2	4	6	6	7	8	8	8	8	8	8	10	24
1270-01-099-3206WF-D	LOW NOISE	M	16.3	2	4	9	6	6	0	0	4	8	11	12	13	14	15	15	15	16	17	17	21	27
1270-01-099-3253WF-E	CONTR BD	D	8.5	0	2	1	3	3	0	0	3	4	5	7	8	8	9	9	9	9	10	10	12	12
1270-01-101-5290WF-F	CONTROL BC	A	10.2	1	2	5	2	2	0	0	0	0	1	2	3	3	4	4	4	4	5	5	6	15
1270-01-107-0140WF-G	SAMPLE ASS	A	11.2	1	9	4	4	4	0	0	6	7	8	9	10	10	11	12	12	12	12	12	13	24
1270-01-102-2963WF	LOW PWR RF	RF	26.7	1	4	2	14	63	1	1	1	2	3	6	7	15	19	19	20	20	20	20	20	20
1270-01-077-0710WF-A	REC ASSY	M	30.6	1	8	11	18	18	1	4	10	14	17	20	23	27	29	29	29	30	30	41	46	46
1270-01-077-0724WF	REF SOURCE	M	30.6	13	34	7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
1270-01-077-0836WF-B	PWR SUPPLY	A	8.5	1	3	2	2	2	0	0	0	0	0	1	1	2	3	3	3	3	3	3	6	11
1270-01-099-3205WF-C	PHASE LOCK	M	28.0	1	9	3	6	6	0	0	0	0	3	5	5	7	8	8	8	8	8	8	12	22
1270-01-099-3206WF-D	LOW NOISE	M	16.3	2	4	8	6	6	0	0	0	3	6	8	9	12	12	12	13	13	13	13	22	24
1270-01-099-3253WF-E	CONTR BD	D	8.5	0	2	1	3	3	0	0	0	1	3	4	4	6	7	7	7	7	7	7	10	10
1270-01-101-5290WF-F	CONTROL BC	A	10.2	1	1	4	2	2	0	0	0	0	0	1	1	2	3	3	3	3	3	3	5	11
1270-01-107-0140WF-G	SAMPLE ASS	A	11.2	1	8	3	4	4	0	0	0	4	7	9	9	11	12	12	12	12	12	12	17	20

D

Figure 3B - Repair Hour Constraints

Figure 3B is an example of the repair hours constraints we use in determining the quarterly repair forecast. In this case, LRU hours was used as the constraint. DRIVE shows the resulting breakout by LRU test stand and SRU shop. Similar logic applies to capacity constraints for bi-weekly repair prioritization.

Descriptions of terms used:

Column Heading	Description
Shop	Shop Name. LRU target hours represents the total LRU shop hours available and includes both organic and contract hours for the quarterly computation. Individual shops, LRU stands (CI, DI, PP, RF) and SRU shops, represent the level of effort (in hours) that results from the overall limit. DRIVE could be programmed to allow constraints by individual shop.
LEVEL #	Correlates to HRS level used in Figure 3A. The first line shows the LRU hour constraint. The following lines show the resulting level of effort (in standard repair hours) for each shop.

	Level #										
	1	2	3	4	5	6	7	8	9	10	11
LRU shop target hours	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000
CI stand hours used	4225	4500	4821	5173	5642	6055	6409	6729	6986	7271	7435
DI stand hours used	636	764	904	1034	1207	1392	1571	1776	1995	2241	2491
PP stand hours used	1026	1246	1535	1888	2199	2544	2903	3308	3735	4101	4477
RF stand hours used	4118	4511	4746	4911	4971	5020	5117	5190	5284	5397	5603
Analog SRU shop hours used	5431	6111	6802	7438	7960	8714	9632	10579	11222	11943	12741
Digital SRU shop hours used	3880	4449	5003	5619	6154	6746	7471	8149	8766	9546	10512
Microwave SRU shop hours used	10281	10638	11191	12072	12854	14157	15618	16472	17208	17860	18612

APPENDIX B

In this Appendix we identify all of the current data used by DRIVE and additional data to be incorporated into DRIVE. We include the sources for the data currently used by DRIVE.

The Recoverable Consumption Item Requirements System (D041). OPR-Mr Tom Kramer, HQ AFLC/MMMR.

1. Quantity per Application (QPA).
2. Application Percent by Mission Design Series (MDS).
3. QPA for Shop Replaceable Units (SRUs) to Line Replaceable Units (LRUs).
4. Application Percent for SRUs.
5. National Stock Number (NSN) and item noun.
6. Item Management Specialist designator.
7. Equipment Specialist designator.
8. Work Unit Code.
9. Weighted Organization and Intermediate Level Maintenance (OIM) demand rate.
10. Base Repair Percent.
11. Depot Condemnation Rate.
12. Replacement Factor in repair.
13. Quarterly Identified Repair Requirement for designated items.

The Central Knowledge System (D143H). OPR-Ms Pat Graff, HQ AFLC/MMLA.

1. NSN and Stock Record Account Number (SRAN).
2. Date of Last Update.
3. Serviceables On-Hand at the Depot.
4. Reparables in Base Repair.
5. Base Back Orders.
6. Current War Readiness Spares Kit/Base Level Self Sufficiency (WRSK/BLSS) kit levels.
7. Serviceables In-Transit to the Base.
8. Reparables In-Transit to the Depot.

The Stock Control and Distribution System (D035). OPR-Mr Bob Brant, HQ AFLC/MMLA.

1. NSN and SRAN
2. Shortages in Awaiting Parts (AWP) stock at the Base.

Depot Maintenance Production Tracking System (G004L). OPR-Mr Ed Valverty, HQ AFLC/MAPS.

1. Reparables in Depot Repair (Condition Code M).
2. Shortages in AWP stock at the Depot.

Depot Supply Stock Control System (D033). OPR-Mr Lonnie Tutle, HQ AFLC/DSSL.

1. NSN
2. Serviceables On-Hand at the Depot.
3. Unserviceables Available for Induction at the Depot.

MICAP Reporting System (D165B). OPR-Ms Ruth Ann Koogler, HQ AFLC/MMLSC.

1. NSN and SRAN
2. Mission Capable (MICAP) rates.

SPECIAL DATA FILES - This data isn't currently contained on an automated data file. It is currently input to DRIVE manually.

1. Subgroup Master NSN.
2. Interchangeable and Substitutable Master NSN.
3. Sub Code A and B.
4. LRU NSN.
5. LRU Test Stand Type.
6. LRU Standard Repair Hours.
7. LRU Depot Stock Level.
8. LRU and SRU NSN.
9. SRU Test Stand Type.
10. SRU Standard Repair Hours.
11. SRU Standard Test Hours.
12. SRU Depot Stock Level.
13. SRAN.
14. Organization.
15. Programmed Aircraft Authority (PAA) and Quarterly Flying Hour Program by MDS.
16. Order and Ship Time (by SRAN).
17. Part Number (by NSN).
18. Control Number (by NSN).

OTHER DRIVE INPUTS - This data isn't currently in DRIVE. We need to investigate it for inclusion within the model.

1. Contract Repair Quantity—Total.
2. Contract Repair Quantity—Produced to Date.
3. Serviceables at the Contractor.
4. Quantity of Reparables On-Hand at the Contractor.
5. Quantity in Work at the Contractor.
6. Forecast Deliveries from the Contractor.
7. Condemnation Rate (if different from Depot).
8. Contract Procurement Quantity—Total.
9. Contract Procurement Quantity—Produced to Date.
10. Quantity of Serviceables at the Contractor.
11. Forecast Deliveries from the Contractor.
12. Expected wartime demand rates.